Internet Journal of Allied Health Sciences and Practice

Volume 22 | Number 3 Article 2

June 2024

Undergraduate Allied Healthcare Professional Students' Perceived Knowledge of Children with Autism Spectrum Disorder

Meghna Patel
University of Pretoria, meghna.patel0203@gmail.com

Sthembiso Ncube
University of Pretoria, sthe.ncube15@gmail.com

Maria du Toit
University of Pretoria, maria.dutoit@up.ac.za

Carlien Muller Vorster
University of Pretoria, carlienwerk@gmail.com

Raeesa Dawood
University or Pretoria, raeesa.dawood1@gmail.com

See next page for additional authors

Recommended Citation

Patel M, Ncube S, du Toit M, Muller Vorster C, Dawood R, du Preez C, et al. Undergraduate Allied Healthcare Professional Students' Perceived Knowledge of Children with Autism Spectrum Disorder. The Internet Journal of Allied Health Sciences and Practice. 2024 Jun 26;22(3), Article 2.

Undergraduate Allied Healthcare Professional Students' Perceived Knowledge of Children with Autism Spectrum Disorder

Abstract

Purpose: Allied healthcare professionals are key stakeholders involved in managing children with autism spectrum disorder. Adequate knowledge, interprofessional education, and collaborative practice should therefore be fostered through a responsive curriculum from an undergraduate level. This study aimed to describe the knowledge of final-year undergraduate allied healthcare professional students from a South African university regarding risk factors, symptoms, and intervention considerations for children with autism spectrum disorder. **Method:** A cross-sectional e-survey design was implemented, and data were analyzed using descriptive statistics and content analysis. The e-survey was distributed to 170 undergraduate students. **Results:** A total of 59 participants from the following study programs completed the survey: Audiology (n=10), Human Nutrition (n=6), Occupational Therapy (n=5), Physiotherapy (n=10) and Speech-Language Pathology (n=28). Overall, participants perceived their knowledge of autism spectrum disorder to be poor-to-average (71%; *N*=42). Participants identified the disorder's symptoms (69%; *N*=41) more accurately compared to risk factors (51%; *N*=30). Discrepancies across study programs were apparent regarding when to initiate intervention. Participants showed substandard understanding of evidence-based intervention approaches (47%; *N*=28). Across study programs, participants were unaware of the roles other allied healthcare professionals played in service provision areas. **Conclusions:** This study identified multiple gaps in the students' knowledge across all study programs regarding risk factors and symptoms, screening, accurate multidisciplinary, referrals as well as timely intervention. **Recommendations:** Future undergraduate curricula should therefore focus on disorder-specific and in-depth knowledge, while including interprofessional and collaborative service provision as autism spectrum disorder requires multidisciplinary management.

Author Bio(s)

Meghna B. Patel, BA SLP, is a speech-language therapist and is currently pursuing her master's degree in Speech-Language Pathology at the University of Pretoria in South Africa. She is currently in collaboration with Crestcare Hospital as well as owns a private practice to provide speech-language therapy.

Sthembiso Ncube, MA SLP, is a speech-language therapist and is currently pursuing her doctoral degree at the University of Pretoria in South Africa. She is currently employed as a research assistant in the Department of Speech-Language Pathology and Audiology.

Maria du Toit, PhD SLP, Lecturer and postdoctoral research fellow in the Department of Speech-Language Pathology and Audiology at the University of Pretoria. She has partnerships with Kenyatta University and Future Families, an NGO supporting vulnerable populations and owns a private practice.

Carlien Muller Vorster, PhD SLP, is a speech-language therapist who has published and reviewed various peer-reviewed articles, conference posters and proceedings focused on Autism and access to care. She is currently part of the Literacy Task team selected by the South African Speech Language and Hearing Association.

Raeesa Dawood, BA SLP, is a speech-language therapist and is currently pursuing her master's degree in Speech-language Pathology at the University of Pretoria in South Africa. She is currently in collaboration with the Trade Route City Wellness Centre and owns a private practice to provide speech-language therapy.

Chriséle du Preez, BA SLP, is a speech-language therapist and is currently pursuing her master's degree in Speech-Language Pathology at the University of Pretoria in South Africa. She is currently working for a private practice providing speech-language therapy in the areas of early communication intervention (ECI),

articulation and language disorder.

Renata Eccles, DPhil SLP, is a senior lecturer in the Department of Speech-Language Pathology and Audiology at the University of Pretoria. She holds international certifications in parent/caregiver and early childhood practitioner coaching from Hanen (It Takes Two to Talk, More Than Words and Learning Language and Loving It).

Acknowledgements

We would like to thank the final year undergraduate allied healthcare professional students who participated in this study, and all supporting Departments for your valued contributions.

Authors

Meghna Patel, Sthembiso Ncube, Maria du Toit, Carlien Muller Vorster, Raeesa Dawood, Chriséle du Preez, and Renata Eccles

IJAHSP™
The Internet Journal of Allied Health Sciences and Practice
Dedicated to allied health professional practice and education
Vol. 22 No. 3 ISSN 1540-580X

Undergraduate Allied Healthcare Professional Students' Perceived Knowledge of Children with Autism Spectrum Disorder

Meghna Patel
Sthembiso Ncube
Maria du Toit
Carlien Muller Vorster
Raeesa Dawood
Chriséle du Preez
Renata Eccles

University of Pretoria

South Africa

ABSTRACT

Purpose: Allied healthcare professionals are key stakeholders involved in managing children with autism spectrum disorder. Adequate knowledge, interprofessional education, and collaborative practice should therefore be fostered through a responsive curriculum from an undergraduate level. This study aimed to describe the knowledge of final-year undergraduate allied healthcare professional students from a South African university regarding risk factors, symptoms, and intervention considerations for children with autism spectrum disorder. **Method:** A cross-sectional e-survey design was implemented, and data were analyzed using descriptive statistics and content analysis. The e-survey was distributed to 170 undergraduate students. **Results:** A total of 59 participants from the following study programs completed the survey: Audiology (n=10), Human Nutrition (n=6), Occupational Therapy (n=5), Physiotherapy (n=10) and Speech-Language Pathology (n=28). Overall, participants perceived their knowledge of autism spectrum disorder to be poor-to-average (71%; *N*=42). Participants identified the disorder's symptoms (69%; *N*=41) more accurately compared to risk factors (51%; *N*=30). Discrepancies across study programs were apparent regarding when to initiate intervention. Participants showed substandard understanding of evidence-based intervention approaches (47%; *N*=28). Across study programs, participants were unaware of the roles other allied healthcare professionals played in service provision areas. **Conclusions:** This study identified multiple gaps in the students' knowledge across all study programs regarding risk factors and symptoms, screening, accurate multidisciplinary, referrals as well as timely intervention. **Recommendations:** Future undergraduate curricula should therefore focus on disorder-specific and in-depth knowledge, while including interprofessional and collaborative service provision as autism spectrum disorder requires multidisciplinary management.

Keywords: perceived knowledge, autism spectrum disorder, undergraduate students, allied healthcare professional, interprofessional education and collaborative practice.

INTRODUCTION

Autism spectrum disorder (ASD) is a global public health concern with a prevalence rate of 65/10 000.[1] Early screening, identification and referrals are essential for timely intervention to support this population.[2,3] There is a high demand for ASD-related services in South African hospitals and clinics, and allied healthcare professionals (AHPs) are expected to treat children with ASD directly after completing their studies, thus, suitable undergraduate (UG) training of AHPs is crucial.[4, 5]

Previous research regarding knowledge of ASD indicated that UG AHP students felt better equipped with the disorder's general characteristics, obtained from personal experiences and external exposure, rather than its risk factors, screening and referral processes.[6] Moreover, some professionals reported that not receiving adequate UG training resulted in reduced confidence to administer ASD-specific screening to detect risk factors and early signs, and make appropriate referrals thereafter.[7,8] An inability to confidently identify risk factors and red flags, especially in the presence of co-occurring conditions and overlapping characteristics, further complicates referrals, leading to misdiagnosis and delayed intervention.[9,10,11]

Numerous countries recommend a multidisciplinary team approach to share responsibilities of monitoring and providing timely services for ASD.[12] UG curricula should emphasize interprofessional education and collaborative practice to support integrated service provision, focusing on specific needs rather than a generalized, 'one size fits all' approach.[13,14]

Early identification of ASD is also challenging as toddlers display rapid changes in development.[15] AHPs and nurses in low-and middle-income countries play an essential role in early identification, as they are typically families' first point of contact during childhood clinic visits, prior to a formal diagnosis.[11,16,17] This puts them in pivotal positions to screen children for possible risk factors and red flags.[1,18,19] Having knowledge of subtle indications of neurodiverse development from a UG level already, can help AHPs improve early detection of ASD.[17,18]

Evaluating UG AHP students' knowledge of ASD-related service delivery can assist in identifying gaps to be addressed through curricula refinement, allowing for children with ASD to possibly be diagnosed up to two years earlier than the current diagnosis age.[19] Children with ASD should ideally be identified and diagnosed within the critical age period of 18-24 months, however, in South Africa, it typically ranges from 42-96 months.[9,20,21] It is therefore vital to equip AHPs with adequate knowledge, from as early as their UG training, to assist with early referral for diagnosis and facilitate evidence-based early intervention.[22, 23]

AHPs in lower-and middle-income countries are expected to provide evidence-based early intervention within an overburdened healthcare system, where access to ASD services is limited and severely strained.[24,25] Insufficient knowledge of ASD intervention and evidence-based approaches amongst AHPs creates additional barriers to timely ASD services, causing further delayed and poor-quality intervention.[6,22]

Most practicing professionals have indicated that receiving more in-depth knowledge and training as UG students would have increased their confidence in service provision.[26] The knowledge of UG AHP students in South Africa, however, is rarely explored despite the importance of their perspectives.[27] By considering students' multidisciplinary management knowledge, an even greater overall understanding can be gained.[14] It is therefore essential to begin by investigating the extent of theoretical knowledge and training UG AHP students receive, as this can subsequently lead to the development of a compendious curriculum. Therefore, this study explored UG AHP students' knowledge of risk factors, symptoms and intervention considerations for children with ASD.

METHOD

Study Aim

This study aimed to describe the current knowledge of final-year UG AHP students from a South African university regarding risk factors, symptoms, and intervention considerations for children with ASD.

Study Design

A cross-sectional survey design was utilized by final-year SLP students to collect data using purposive sampling from final-year UG AHP students from a South African university.

Measurement Tool

The e-survey was derived using multiple sources and contained closed-and-open-ended questions.[6,8,16,22,28,29] It was composed of three sections that covered biographical information, general ASD knowledge, risk factors, symptoms, screening, assessment and intervention.

Procedures

After ethical approval [blinded for review] was obtained from [blinded for review], the researchers approached the Heads of Departments from the Audiology, Human Nutrition (HN), Occupational Therapy (OT), Physiotherapy (PT) and Speech-Language Pathology (SLP) study programs via email to provide information about the study, and request for them to share the survey's link with final-year UG students in their respective departments. The informed consent and e-survey were then distributed to 170 students (Audiology=26; HN=18; OT=46; PT=42; SLP=38) by the relevant head of departments, providing them with three months to complete the questionnaire.

Data Analysis

After data were collected, quantitative and qualitative categories were filtered and analyzed using all descriptive statistical measures as well as content analysis. The researchers organized the data into codes, categorized the data under their relevant headings and reported their findings accordingly.[30]

RESULTS

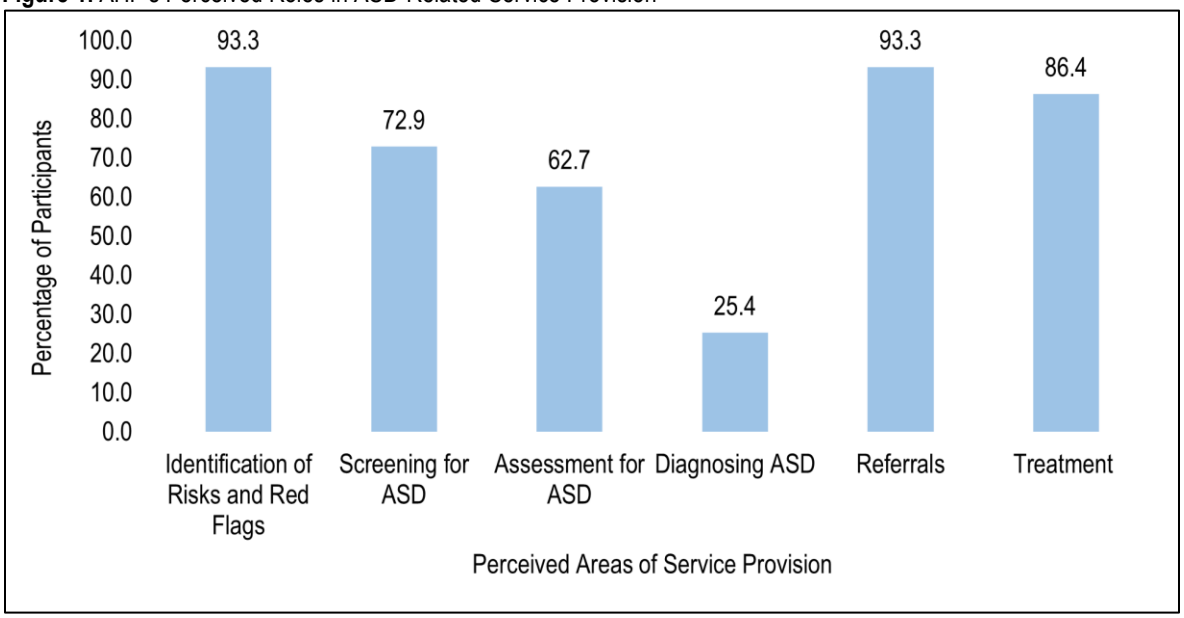
Fifty-nine (34.7%) of 170 potential participants completed the survey. The breakdown of participants per study program is outlined in Table 1.

Table 1. Break-down of Participants per Study Programs

Study Programs	Demographic of Participants
Audiology	16.9% (*n*=10)
Human Nutrition	10.2% (*n*=6)
Occupational Therapy	8.5% (*n*=5)
Physiotherapy	16.9% (*n*=10)
Speech-Language Pathology	47.5% (*n*=28)
Total	**59**

The majority of participants (83.1%, *N*=49) reported having obtained their ASD knowledge from their current study program, with 61% of participants (*N*=36) having done so during practical modules. Overall, on a scale of 0-4 ("None", "Poor", "Average", "Good" and "Very good"), participants perceived their knowledge of ASD to be poor to average (mean=1.95, standard deviation=0.79). Participants were asked to select the correct definition of ASD. Over half of the participants (*N*=40; 67.8%) correctly defined ASD according to the DSM-5 definition.[28] Of the three incorrect options, 30.5% of participants (*N*=18) selected a semantically similar decoy to the correct option. When asked if and what roles AHPs play in service provision for children with ASD, 91.5% (*N*=54) of participants indicated "yes", while 8.5% (*N*=5) were "not sure", with the breakdown of areas demonstrated in Figure 1.

Figure 1. AHP's Perceived Roles in ASD-Related Service Provision



When participants' knowledge of red flags, risk factors and symptoms was probed, the following was the most correctly selected option for these domains, respectively: "Difficulty understanding others' feelings and their own" (94.9%; *N*=56); "Family history/genetics" (86.4%; *N*=51) and "Lack of/poor eye contact" (93.2%; *N*=55) [Table 2]. "Has a hearing loss diagnosis" was selected incorrectly by 30% (n=3) of audiology participants as a red flag, while "Hearing problem/impairment" was incorrectly identified as an ASD symptom by 50% of HN participants (*n*=3), 40% of OT participants (*n*=2) and 28.6% of SLP participants (*n*=8). Additionally, "Typical language skills" was incorrectly selected by 66.7% of HN participants (*n*=4) and 40% of OT participants (*n*=2). Despite being incorrect, 40% of PT participants identified "Abnormal body posturing" (*n*=4) as a symptom of ASD.

Table 2. Correctly Identified Red Flags, Risk Factors and Symptoms by Participants

	A (*n*=10)	**HN (*n*=6)**	**OT (*n*=5)**	**PT (*n*=10)**	**SLP (*n*=28)**	**Total (*N*=59)**
Red Flags						
Difficulty understanding others' feelings and their own	90% (9)	100% (6)	100% (5)	90% (9)	96.4% (27)	**94.9% (56)**
Avoids eye contact	100% (10)	50% (3)	80% (4)	90% (9)	100% (28)	**91.5% (54)**
Repeat words or phrases over and over (echolalia)	100% (10)	66.7% (4)	80% (4)	50% (5)	96.4% (27)	**84.7% (50)**
Doesn't engage in pretend play by 18 months of age	70% (7)	83.3% (5)	80% (4)	70% (7)	78.6% (22)	**76.3% (45)**
Rocks body	70% (7)	50% (3)	100% (5)	20% (2)	100% (28)	**76.3% (45)**
Doesn't respond to their name by 12 months of age	40% (4)	83.3% (5)	60% (3)	20% (2)	71.4% (20)	**57.6% (34)**

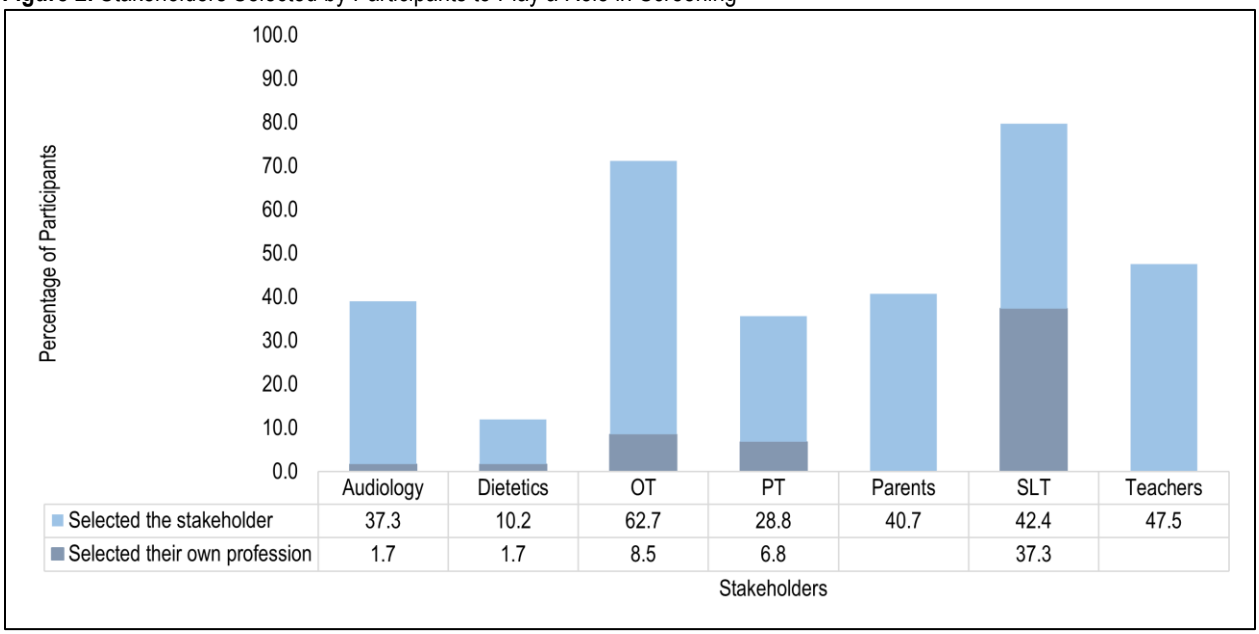
	A (*n*=10)	HN (*n*=6)	OT (*n*=5)	PT (*n*=10)	SLP (*n*=28)	Total (*N*=59)
Risk factors						
Family History/Genetics	70% (7)	83.3% (5)	100% (5)	70% (7)	96.4% (27)	**86.4% (51)**
Male Gender	90% (9)	0%	20% (1)	50% (5)	92.9% (26)	**69.5% (41)**
Advanced parental age at the time of conception	10% (1)	66.7% (4)	60% (3)	40% (4)	75% (21)	**55.9% (33)**
Extreme prematurity	70% (7)	16.7% (1)	0%	70% (7)	60.7% (17)	**54.2% (32)**
In-utero exposure to drugs and infections	40% (4)	66.7% (4)	20% (1)	30% (3)	71.4% (20)	**54.2% (32)**
Maternal health complications	70% (7)	66.7% (4)	0%	40% (4)	60.7% (17)	**54.2% (32)**
Very low birth weight	60% (6)	16.7% (1)	20% (1)	50% (5)	57.1% (16)	**49.2% (29)**
Birth complications	60% (6)	33.3% (2)	0%	50% (5)	42.9% (12)	**42.4% (25)**
Other coexisting disorders	40% (4)	16.7% (1)	20% (1)	30% (3)	53.6% (15)	**40.7% (24)**
Maternal smoking	30% (3)	33.3% (2)	0%	50% (5)	39.3% (11)	**35.6% (21)**
Prenatal exposure to air pollution or certain pesticides	20% (2)	0%	20% (1)	30% (3)	39.3% (11)	**28.8% (17)**
Symptoms						
Lack of/poor eye contact	90% (9)	100% (6)	100% (5)	80% (8)	96.4% (27)	**93.2% (55)**
Gets upset with minor changes in routines	80% (8)	66.7% (4)	80% (4)	100% (10)	92.9% (26)	**88.1% (52)**
Emotional regulation difficulties	90% (9)	83.3% (5)	60% (3)	80% (8)	92.9% (26)	**86.4% (51)**
Involuntary and restricted repetitive movements	90% (9)	66.7% (4)	100% (5)	50% (5)	92.9% (26)	**83.1% (49)**

	A (*n*=10)	HN (*n*=6)	OT (*n*=5)	PT (*n*=10)	SLP (*n*=28)	Total (*N*=59)
Sensory difficulties	80% (8)	50% (3)	80% (4)	70% (7)	92.9% (26)	**81.4% (48)**
Obsessive interests	80% (8)	66.7% (4)	40% (2)	90% (9)	89.3% (25)	**81.4% (48)**
Delayed/difficulties with communication	60% (6)	83.3% (5)	60% (3)	80% (8)	82.1% (23)	**76.3% (45)**
Walking on toes	30% (3)	33.3% (2)	40% (2)	10% (1)	85.7% (24)	**54.2% (32)**
Regression of language	40% (4)	50% (3)	60% (3)	10% (1)	64.3% (18)	**49.2% (29)**
Playing with toys/objects in the same way	60% (6)	16.7% (1)	20% (1)	30% (3)	60.7% (17)	**47.5% (28)**
Self-abusive behaviors	30% (3)	66.7% (4)	20% (1)	0%	64.3% (18)	**44.1% (26)**

Abbreviations: HN, Human Nutrition; OT, Occupational Therapy; PT, Physiotherapy; SLP, Speech-Language Pathology

Differing responses were collected from participants regarding their own and other stakeholders' roles in screening children for ASD (Figure 2). Various Audiology (10%; n=1), HN (16.7%; n=1) and PT (40%; n=4) participants incorrectly perceived their role to exclude ASD screening. Contrastingly, OT (100%; n=5) and SLP (78.6%; n=22) participants correctly selected their professions. AHP students incorrectly perceived parents (40.7%; N=24) and teachers (47.5%; N=28) as stakeholders who cannot conduct ASD screening.

Figure 2. Stakeholders Selected by Participants to Play a Role in Screening



In South Africa, AHPs' roles in service provision to children with ASD exclude making a clinical diagnosis.[31] Participants correctly identified "Child and Adolescent Psychiatrist" (76.3%; *N*=45), "Developmental Pediatrician" (76.3%; *N*=45) and "Pediatric Neurologist" (88.1%; *N*=52) as professionals that can diagnose ASD. "Occupational Therapists" (11.9%; *N*=7) and "Speech-Language Therapists" (15.3%; *N*=9), however, were overall misidentified to make a diagnosis. When asked to select the earliest age range in which ASD can be diagnosed, only 42.4% of the participants (*N*=25) correctly selected between 12 and 24 months [Table 3].

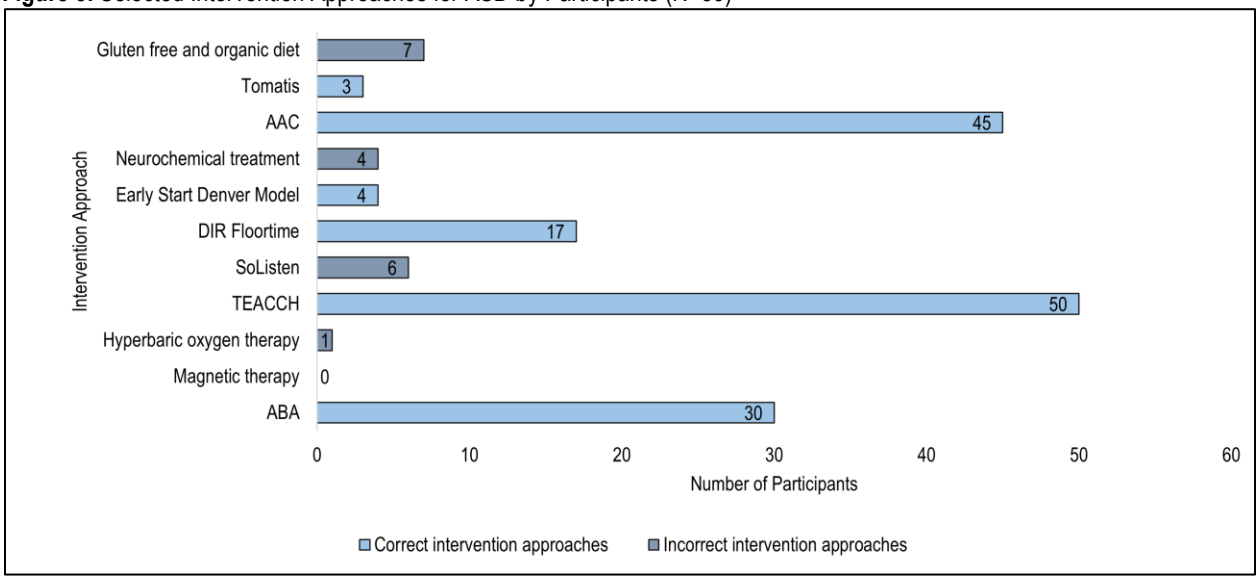
Table 3. Participants' Perceptions of the Earliest Age ASD can be Diagnosed

Age of Diagnosis (months)	Audiology (*n*=10)	HN (*n*=6)	OT (*n*=5)	PT (*n*=10)	SLP (*n*=28)	Total (*N*=59)
0-12	1	4	0	0	5	**16.9% (10)**
12-24	6	0	2	7	10	**42.4% (25)**
24-36	1	1	1	1	5	**15.3% (9)**
36+	1	1	0	0	8	**16.9% (10)**
Not sure	1	0	2	2	0	**8.5% (5)**

Abbreviations: HN, Human Nutrition; OT, Occupational Therapy; PT, Physiotherapy; SLP, Speech-Language Pathology

When participants were probed regarding when to start with early intervention, the majority correctly selected the option "As soon as symptoms are identified" (71.2%, *N*=42). The commonly incorrect option selected by half of the audiology (*n*=5) and HN (*n*=3) participants was "Only after they have received a diagnosis". Evidence-based intervention approaches were investigated, and most participants were able to correctly identify the following options: "Treatment and Education of Autistic and Related Communication Handicapped Children (TEACCH)" (84.7%; *N*=50) and "Alternative and Augmentative Communication" (76.3%; *N*=45).[9] Lower evidence-based treatment approaches that were selected included: "Gluten free and organic diet" (11.9%; *N*=7), "Hyperbaric oxygen therapy" (1.7%; *N*=1), "Neurochemical treatment" (6.8%; *N*=4) and "SoListen" (10.2%; *N*=6) [Figure 3].

Figure 3. Selected Intervention Approaches for ASD by Participants (N=59)



"Occupational Therapist" (93.2%; *N*=55) and "Speech-Language Therapist" (96.6%; *N*=57) were the AHPs most commonly selected to play a role in ASD-related intervention. Students from the respective departments selected their own professions to

intervene: "Audiologist" (80%; *n*=8), "Dietician" (100%; *n*=6), "Occupational Therapist" (100%; *n*=5), "Physiotherapist" (70%; *n*=7) and "Speech-Language Therapist" (96.4%; *n*=27) [Table 4].

Table 4. Distribution of AHPs Selected to Provide Intervention per Study Program

AHP to intervene	Audiology (*n*=10)	HN (*n*=6)	OT (*n*=5)	PT (*n*=10)	SLP (*n*=28)	Total (*N*=59)
Speech-Language Therapist	10	6	5	9	27	**96.6% (57)**
Occupational Therapist	9	6	5	9	26	**93.2% (55)**
Audiologist	8	6	4	4	18	**67.8% (40)**
Physiotherapist	5	6	2	7	19	**66.1% (39)**
Dietician	3	6	1	0	16	**44.1% (26)**

Abbreviations: AHP, Allied Healthcare Professional; HN, Human Nutrition; OT, Occupational Therapy; PT, Physiotherapy; SLP, Speech-Language Pathology

DISCUSSION

Providing timely ASD-specific services for children requires AHPs to confidently identify risk factors and symptoms, conduct screening and provide early intervention. [9,10] This study thus highlights the current knowledge of final-year UG AHP students regarding ASD management.

Literature suggests AHPs receiving their knowledge from personal and media exposure rather than through their formal training curriculum forms a barrier to service provision.[6,16,22] Conversely, this study found that many participants had received their ASD knowledge through theoretical and some practical exposure. Despite this, these participants perceived their knowledge as poor-to-average, indicating that UG ASD training received may have been insufficient in fostering confidence for service provision.[6,7,8] Their perceptions could be substantiated when analyzing their knowledge of the DSM-5's definition of ASD, in which one-third of participants selected a semantically similar decoy.[28] This shows a possible lack of knowledge, affecting all areas of service provision.

Most participants agreed that their professions play important roles in service provision, however, discrepancies occurred when participants were asked to identify more specific areas. Confusion was apparent about whether or not AHPs should screen for, assess and diagnose ASD, with OT and SLP participants having a more accurate understanding of their professional roles in service provision than Audiology, HN and PT participants. This is concurrent with previous literature, which found OTs and SLPs, who are prominent AHPs in the management of children with ASD, to be frequently sought out as key stakeholders.[32]

Parallel with the current study, similar research has collectively concluded that despite AHPs' general understanding of ASD, in-depth knowledge of risk factors and symptoms is still lacking.[6,29,33] Participants in this study more confidently selected red flags rather than risk factors and symptoms, with misconceptions apparent across study programs. Regardless of a hearing loss diagnosis not qualifying as a red flag of ASD, some audiology participants believed this to be true. Additionally, almost half the PT participants incorrectly selected the symptom "abnormal body posturing", which aligns with other literature regarding physiotherapists' shortcomings in identifying ASD symptoms.[29] Inabilities to accurately identify risk factors and symptoms may also directly hinder the involvement of other essential AHPs, leading to fewer interprofessional collaborations and ultimately, preventing holistic approaches to intervention, despite the necessity of multidisciplinary services.[12,14]

Research indicates that children with ASD are often unidentified or misidentified due to a lack of screening knowledge.[34] In this study, variations across participating programs of which stakeholders are responsible to screen for ASD were evident, with more uncertainty of their own roles shown by audiology, HN and PT participants. This could be related back to their difficulties in identifying red flags and symptoms correctly, underpinning their hesitancy to screen. Additionally, less than half of the participants selected parents and teachers despite them being in an optimal position to aid with screening as they often have the best knowledge of the child's development and behavior.[9]

Participants in this study accurately selected professionals who can diagnose ASD, however, prominent misconceptions were occupational therapists and speech-language therapists, who cannot make a formal diagnosis.[31] More confusion was seen when determining the earliest age of diagnosis, where less than half the participants correctly selected between 12-24 months, and several others felt that a diagnosis can only be made after 3 years of age.[9] These findings directly support other studies' results, which found the age of diagnosis in South Africa to be extremely delayed.[20,21] Delayed diagnosis negatively impacts service provision as early identification and intervention takes advantage of neuroplasticity, leading to the most effective outcomes.[35] Concerningly, some participants believed intervention should only begin after a formal diagnosis is made rather than as soon as symptoms are identified, further hindering timely intervention.

When exploring participants' knowledge of evidence-based intervention approaches, it was apparent they had a strong overall understanding. Most participants were also well equipped with knowledge that approaches such as hyperbaric oxygen therapy and magnetic therapy are non-evidence-based in treating children with ASD; this is considered a strength of this study.[36] Selections of minimally effective approaches such as a gluten-free and organic diet were, however, still made, highlighting a possible gap in knowledge regarding evidence-based intervention approaches.[24, 32]

Concurrent with other results from this study and current practice, occupational therapists and speech-language therapists were most commonly selected to play a role in ASD intervention.[9, 32] Most participants were also confident of their own profession's role in intervention. Contrastingly, these participants were less aware of the salient roles audiologists, physiotherapists and dieticians play, further emphasizing their reduced knowledge of multidisciplinary service provision and collaborative practice.[14, 37] There are strengths and limitations to this study. Due to the COVID-19 pandemic, the study's survey had to be adapted to an online platform, making it difficult to encourage participation. Although this study consisted of a small sample size from one South African university, it involved perspectives of students from five different departments. This study was unique to South Africa at the time as it was conducted by a group of final-year UG students with intentions of spotlighting current service provision from a unique angle, as UG students have often been overlooked stakeholders.[27] Their input is essential to shaping future curricula by reflecting on gaps and strengths in knowledge and making adaptations accordingly. This study's findings are noteworthy and conclusions from the findings are significant to contribute to UG AHP training.

CONCLUSION

Throughout the study, it was apparent that participants were equipped with basic ASD knowledge, however, they lacked specific details and an in-depth understanding, which may severely hinder future service provision.[38] UG AHP curricula should thus target risk factors, symptoms, and intervention considerations for children with ASD more comprehensively, while continuously substantiating the importance of interprofessional education and collaborative practice. To expand understanding of knowledge and confirm findings, future research can be done on a broader scale by focusing on the knowledge of UG final year AHP students from other universities countrywide. Additionally, the ASD-specific knowledge of other healthcare professional students, such as nurses and medical doctors, can also be explored to gain a better understanding of their abilities to provide services for this growing vulnerable population.

DISCLOSURE STATEMENT

The authors have no conflict of interest to disclose.

FUNDING

This study did not receive any funding.

REFERENCES

1. Zeidan J, Fombonne E, Scorah J, et al. Global prevalence of autism: A systematic review update. *Autism Res*. 2022;15(5):778-790. doi:10.1002/aur.2696
2. Franz L, Chambers N, von Isenburg M, de Vries PJ. Autism spectrum disorder in sub-Saharan Africa: A comprehensive scoping review. *Autism Res*. 2017;10(5):723-749. doi:10.1002/aur.1766
3. Guthrie W, Swineford LB, Nottke C, Wetherby AM. Change in clinical diagnosis and symptom presentation. *J Child Psychol Psychiatry*. 2014;54(5):582-590. doi:10.1111/jcpp.12008.Early
4. Reid S. 20 Years of community service in South Africa: what have we learnt? *South African Heal Rev*. 2018;2018(1):41-50. https://doi.org/10.10520/EJC-144916d9ce.
5. Williams-Arya P, Anixt J, Ehrhardt J, Manning-Courtney P. Improving access to diagnostic assessments for autism spectrum disorder using an arena model. *J Dev Behav Pediatr*. 2019;40(5):406. doi:10.1097/DBP.0000000000000694

6. Freedman SE. Knowledge of autism spectrum disorder among college students in health care disciplines. *Perspect Issues High Educ*. 2014;17(1):17-26. doi:10.1044/aihe17.1.17
7. Pierce K, Courchesne E, Bacon E. To screen or not to screen universally for autism is not the question: why the task force got it wrong. *J Pediatr*. 2016;176:182-194. doi:https://doi.org/10.1016/j.jpeds.2016.06.004
8. Self TL, Coufal K, Parham DF. Allied healthcare providers' role in screening for autism spectrum disorders. *J Allied Health*. 2010;39(3):165-174.
9. Hyman SL, Levy SE, Myers SM. Identification, evaluation, and management of children with autism spectrum disorder. *Pediatrics*. 2020;145(1). doi:10.1542/peds.2019-3447
10. Mayes SD, Calhoun SL, Mayes RD, Molitoris S. Autism and ADHD: Overlapping and discriminating symptoms. *Res Autism Spectr Disord*. 2012;6(1):277-285. doi:10.1016/j.rasd.2011.05.009
11. Weill VA, Zavodny S, Souders MC. Autism spectrum disorder in primary care. *Nurse Pract*. 2018;43(2):21-28. doi:10.1097/01.NPR.0000529670.62188.la
12. World Health Organisation. Autism spectrum disorders & other developmental disorders: From raising awareness to building capacity. *World Heal Organ Geneva, Switz*. 2013;1(September):1-36.
13. Dillenburger K, Röttgers H, Dounavi K, et al. Multidisciplinary teamwork in autism: can one size fit all? *Aust J Educ Dev Psychol*. 2014. doi:10.1017/edp.2014.13
14. Pitout H, Adams F, Casteleijn D, du Toit SHJ. Factors to consider in planning a tailored undergraduate interprofessional education and collaborative practice curriculum: A scoping review. *South African J Occup Ther*. 2022;52(1). doi:10.17159/2310-3833/2022/vol52n1a9
15. Mukherjee SB, Aneja S, Krishnamurthy V, Srinivasan R. Incorporating developmental screening and surveillance of young children in office practice. *Indian Pediatr*. 2014;51(8):627-635. doi:10.1007/s13312-014-0465-1
16. Bakare MO, Tunde-Ayinmode MF, Adewuya AO, et al. Recognition of Autism Spectrum Disorder (ASD) symptoms and knowledge about some other aspects of ASD among final year medical students in Nigeria, Sub-Saharan Africa. *BMC Res Notes*. 2015;8(1):1-8. doi:10.1186/s13104-015-1433-0
17. Marlow M, Servili C, Tomlinson M. A review of screening tools for the identification of autism spectrum disorders and developmental delay in infants and young children: recommendations for use in low- and middle-income countries. *Autism Res*. 2019;12(2):176-199. doi:10.1002/aur.2033
18. Barbaro J, Ridgway L, Dissanayake C. Developmental surveillance of infants and toddlers by maternal and child health nurses in an Australian community-based setting: Promoting the early identification of autism spectrum disorders. *J Pediatr Nurs*. 2011;26(4):334-347. doi:10.1016/j.pedn.2010.04.007
19. O'Brien M, Troy K, Kirkpatrick J. The allied health work readiness study: Identifying personal characteristics signalling work readiness in allied health students. *Internet J Allied Heal Sci Pract*. 2020;18(1):5.
20. Springer PE, van Toorn R, Laughton B, Kidd M. Characteristics of children with pervasive developmental disorders attending a developmental clinic in the Western Cape Province, South Africa. *SAJCH South African J Child Heal*. 2013;7(3):95-99. doi:10.7196/SAJCH.530
21. Van Biljon S, Kritzinger A, Geertsema S. A retrospective case report on demographic changes of learners at a school for children with autism spectrum disorder in the Gauteng Province. *South African J Child Educ*. 2015;5(1):20. doi:10.4102/sajce.v5i1.349
22. Atun-Einy O, Ben-Sasson A. Pediatric allied healthcare professionals' knowledge and self-efficacy regarding ASD. *Res Autism Spectr Disord*. 2018;47(June 2017):1-13. doi:10.1016/j.rasd.2017.12.001
23. Grinker RR, Chambers N, Njongwe N, et al. "Communities" in community engagement: Lessons learned from autism research in South Korea and South Africa. *Autism Res*. 2012;5(3):201-210. doi:10.1002/aur.1229
24. Antezana L, Scarpa A, Valdespino A, Albright J, Richey JA. Rural trends in diagnosis and services for autism spectrum disorder. *Front Psychol*. 2017;8. doi:10.3389/fpsyg.2017.00590
25. Erasmus S, Kritzinger A, van der Linde J. Families raising children attending autism-specific government-funded schools in South Africa. *J Fam Stud*. 2022;28(1):54-69. doi:10.1080/13229400.2019.1676292
26. Crane L, Davidson I, Prosser R, Pellicano E. Understanding psychiatrists' knowledge, attitudes and experiences in identifying and supporting their patients on the autism spectrum: online survey. *BJPsych Open*. 2019;5(3):8. doi:10.1192/bjo.2019.12
27. Fagrell P, Fahlgren A, Gunnarsson S. Curriculum development and quality work in higher education in Sweden: The external stakeholder perspective. *J Prax High Educ*. 2020;2(1):28-45. doi:10.47989/kpdc62
28. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 5th ed. Arlington, VA; 2022. doi:https://doi.org/10.1176/appi.books.9780890425787

29. Chansa-Kabali T, Nyoni J, Mwanza H. Awareness and knowledge associated with autism spectrum disorders among university students in Zambia. *J Autism Dev Disord*. 2019;49(9):3571-3581. doi:10.1007/s10803-019-04044-7
30. Vaismoradi M, Turunen H, Bondas T. Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nurs Heal Sci*. 2013;15(3):398-405. doi:10.1111/nhs.12048
31. Ellerbeck K, Smith C, Courtemanche A. Care of children with autism spectrum disorder. *Prim Care-Clinics Off Pract*. 2015;42(1):85-98. doi:10.1016/j.pop.2014.09.004
32. Paynter J, Sulek R, Luskin-Saxby S, Trembath D, Keen D. Allied health professionals' knowledge and use of ASD intervention practices. *J Autism Dev Disord*. 2018;48(7):2335-2349. doi:10.1007/s10803-018-3505-1
33. Cheung G, D T, J A, L T. The impact of workplace factors on evidence-based speech-language pathology practice for children with autism spectrum disorders. *Int J Speech Lang Pathol*. 2013;15(4):396-406. doi:https://doi: 10.3109/17549507.2012.714797
34. Gabrielsen TP, Farley M, Speer L, Villalobos M, Baker CN, Miller J. Identifying autism in a brief observation. *Pediatrics*. 2015;135(2):e330–e338. doi:https://doi.org/10.1542/peds.2014-1428
35. Kritzinger A, Mosca R. Practice Guidelines for audiologists and speech-language therapists in early communication intervention. *South African Speech-Language-Hearing Assoc*. 2017:1-18. https://www.saslha.co.za/Content/Documents/Guidelines_for_Early_Communication_Intervention_2017.pdf.
36. Klein N, Kemper KJ. Integrative approaches to caring for children with autism. *Curr Probl Pediatr Adolesc Health Care*. 2016;46(6):195-201. doi:10.1016/j.cppeds.2015.12.004
37. ElObeid T, Moawad J, Shi Z. Importance of nutrition intervention in autistic patients. *Adv Neurobiol*. 2020;24:535–545. doi:https://doi.org/10.1007/978-3-030-30402-7_18
38. Corden K, Brewer R, Cage E. A Systematic Review of Healthcare Professionals' Knowledge, Self-Efficacy and Attitudes Towards Working with Autistic People. *Rev J Autism Dev Disord*. Published online 2021. doi:10.1007/s40489-021-00263-w